TABLE 4.—*Proved Cases of Tularemia at Southern Pacific Hospital, San Francisco, 1928*

Location	Age	Sex	Type	Diagnosis Proved		Source of Infection	Month Infected
				Agglutination	Animal Inoculation		
Las Vegas (So. Nevada)	30	M.	Gland and Ulcer	Yes	Yes Culture	Rabbits	June
Sparks	35	M.	Gland and Ulcer	Yes		Deerfly	July
Sparks	40	M.	Gland and Ulcer	Yes	Yes Culture	Tick bite (Alturas, Calif.)	July
Sparks	35	M.	Gland and Ulcer	Yes		Rabbits	July
Reno	24	M.	Gland and Ulcer	Yes		Rabbits	July
Shoshone	30	M.	Gland and Ulcer	Yes		Ticks	August
Shoshone	28	M.	Gland and Ulcer	Yes		Ticks	August
Ellenberg	38	M.	Typhoidal	Yes		Ticks	August
Elko	28	M.	Gland and Ulcer	Yes	Yes	Rabbit Used knife to skin rabbits and later cut finger on knife	September

wounds, coyote pup bites (both dogs and coyotes having been known to have been chasing rabbits), the wiping of hay knives on machines after cutting through and into rabbits nesting in the hay, barbed-wire cuts, the handling or shearing of sheep, have been noted in our series of cases. In addition, and of what importance, we do not as yet know, one patient only handled turkeys dead from an unknown disease. In our data there is recorded the death of one hundred chickens owned by a physician who fed them rabbit meat and liver. This physician's wife was seen with tularemia, probably from handling the rabbits fed to the chickens, but no examination was made of the chickens.

COMMENT

Tularemia has probably been endemic in Nevada since 1912. There appears to be every type of transmission—rabbits, flies, ticks, contact with other animals apparently healthy such as dogs, coyotes, and sheep, and with such extraneous material as knife blades and barbed-wire. However, no cases have been noted in this series as being due to contact with human cases. The question of immunity of the Indians of Nevada was continually brought to the fore. There is a record of one proved case in a Piute, and other cases have been seen in the Shoshones. It could be stated that, though the wild rabbits have always been a source of meat for the Indians in Nevada, the cases of tularemia in them are rare, or that the Indian is or has become wiser than his white brother. The endemicity of tularemia in the human depends on the disease in the rabbit and the infected blood-sucking insect population of the district. It would appear that in Nevada both of these factors are unusually and definitely present. The mortality rate in the human cases in Nevada, however, has been nil, but final recovery has been exceedingly slow.

Every variety of treatment was suggested as efficacious, but methods such as mercurochrome intravenously, salvarsan intravenously, the use of phenol as a counterirritant in glandular cases, the use of acid mercuric nitrate and arsenical paste as a cautery agent applied to the initial lesion, and the use of the ultra-violet lamp, seem to indicate their nonspecificity.

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TUBERCULOSIS IN A GENERAL HOSPITAL*

By PHILIP KING BROWN, M. D.
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DISCUSSION *by Charles L. McVey, M. D., Oakland; C. E. Atkinson, M. D., Banning.*

EMPHASIS in the treatment of tuberculosis was formerly placed on climate and on altitude, and mitigated against care in general hospitals of both medical and surgical tuberculosis. Now, when tuberculosis of bone demands conditions of light and air treatment which formerly seemed the chief consideration in the treatment of pulmonary tuberculosis, and pulmonary tuberculosis is today aided by surgical care in many cases, every hospital must be fully equipped for the fight against tuberculosis in all its phases. The problems presented, individual in every case, are no longer solved by such generalizations as residence in Arizona or Colorado for an indefinite period in some boarding house. It is a question today of accurate diagnosis, supported by the best of x-ray studies, by a complete history and a physical investigation. A survey of the social and economic problems is also in order. Armed with all the facts—the extent and probable duration of the process, the background of resistance which a good history brings to light, a history of complications, concurrent troubles, financial resources, possibility of freedom from worry—the doctor

* Read at the National Tuberculosis Association meeting, 1928, Portland, Oregon.

may select a sanatorium where he can summon to his aid all resources he may need. And among these aids surgical collapse of the lung must be considered.

The chief arguments in favor of an organization such as the American Sanatorium Association are the standardization of care so far as care can be standardized, the evaluation of all new methods proposed, the suppression as far as possible of all low-grade institutions, and of mystic therapeutic measures, and finally the demanding of the profession that only such cases as will be benefited by the care that a sanatorium affords shall be sent away from home. The ideal sanatorium is the place conducted as a home, a school and a hospital. A patient who on initial examination is found to have a unilateral lesion with a cavity three centimeters in diameter presents a totally different problem from one with limited tuberculous pneumonia and beginning softening, or one who has had compression of the lung to stop loss of blood from hemorrhage. It is presumed that no sanatorium has the right to exist today that does not afford patients an opportunity for some of the artificial means of inducing rest, such as pneumothorax. It is presumed also that the x-ray as an adjunct to diagnosis of tuberculous disease and therapy, is absolutely necessary. I do not believe that artificial pneumothorax is a justifiable procedure unless checked by screen or plate. Even the value of postural rest as an aid to cavity closure cannot be judged by physical signs alone. All these aids to diagnosis and progress are available in general hospitals; it is surprising how few who deal with tuberculous patients employ all the means that are recognized as necessary in modern sanatoriums of studying and following up the cases. Even where the x-ray is available many clinicians study only the findings of thermometer, stethoscope, sputum, and scales. It would seem that such incompletely equipped sanatoriums must more closely follow the scheme of the general hospital to obtain ideal conditions; and that the majority of cases of pulmonary tuberculosis shall be treated on the lines of acute illness needing every aid of investigation and treatment rather than depend upon the too lax and insufficient means of most sanatoriums. The old epigram of Pryor is still all too true, "We must treat the tuberculosis patient in the right place and the right way at the right time until he is cured, instead of in the wrong place and wrong time and wrong way until he is dead."

ANESTHESIA AND TUBERCULOSIS

The problem of tuberculosis in a general hospital is well illustrated by the medical and surgical records of the Southern Pacific Hospital. Of 702 admissions for tuberculosis 440 were for tuberculosis of the lung; 52 for lymphadenitis; 26 for tuberculous laryngitis, etc. From a study of the cases admitted to the Southern Pacific Hospital in the last eight and a half years, nearly 10 per cent of the beds had to be set aside for the care of acute and chronic forms of tuberculosis, both medical and surgical. Of the 29,200 admissions, 702 had tuberculosis in some form. It is unfortunate that no record has been kept of the large group of cases sent in on a diagnosis other than tuberculosis who were found on general routine examination to be suffering from that disease also. So important a finding is this, and so impressed have our surgeons become by the uncovering of unsuspected tuberculosis and syphilis in a large group, that operation is more frequently postponed or done under local anesthesia because of questionable lung soundness than because of any heart defect. This is as it should be, for the soundness of the lungs and upper respiratory tract is imperative when general anesthesia is produced, whereas a very great deal of heart damage sufficiently compensated may not be a contraindication. Dr. Chesley Bush, director of Arroyo Sanatorium, the municipal hospital in Alameda County for tuberculosis patients, stated that while he was resident at a private institution with 182 beds, one-fourth of the admissions were of patients who had previously had a general anesthetic, mostly for tonsil removal, within one year. This result of general anesthesia upon incipient tuberculosis should be brought to the attention of all surgeons, so that no patient be sent to the operating room on whom a careful lung examination has not been made. At Arequipa Sanatorium it is our repeated experience that tuberculosis has followed shortly after ether or other general anesthesia. Among 1250 admissions, to date 34, or 2.7 per cent, belong to this group. Sufficient emphasis has not been placed on this important matter. Patients go to their family doctors with complaint of fatigue and slight fever, and are referred to throat specialists to have a tonsillectomy, or the patient himself goes to the throat specialist who, after an inspection of the tonsils, arranges for their removal. These minor operations do the most damage, for they are entered into casually, frequently without any general examination.

In general hospitals patients are apt to get the advice of specialists in every field except in that of tuberculosis. The care of the tuberculous is a specialty and the public has a right to expect every large hospital to furnish the best available advice in every field of medicine. Where no provision is made for diagnosis of tuberculosis, mistakes made are often regrettable. A patient with epigastric pain applied to a surgeon, the head of a staff of a hospital. No history was taken or general examination made, but a gastro-intestinal x-ray study was ordered. The roentgenologist, in screening the patient, observed an obliterated left pleural cavity with a pneumothorax cavity at the top and the heart and mediastinum drawn far to the left. This report was made, and the surgeon ordered sun baths at home. In three weeks diffuse tuberculosis of the right side developed, the direct result probably of the sun exposures. Sun is a powerful remedy, dangerous in pulmonary tuberculosis and never to be used except under the constant supervision of an expert. Faddisms in medicine are nowhere more dangerous than in the treatment of tuberculosis. Advice of quacks over the radio, and the orange juice fast cure-all of the daily press health column, certainly

do great harm to the tuberculous. Another dangerous faddism is exercise. After the fire in San Francisco and the plague infection the ancient county hospital was burned. Temporarily patients were housed about town, and several hundred found refuge in the reconstructed stables of Ingleside race track; among them patients with pulmonary tuberculosis. A well-meaning medical visitor who knew nothing of tuberculosis suggested to the ward of patients with advanced tuberculosis that nothing could be more opportune than the proximity of a perfectly level measured track of a mile, and that instead of resting constantly in bed, they walk the track twice a day. Thirteen tried it. One died of hemorrhage the next day, and within five weeks two more died, not one of whom had seemed *in extremis* before the fatal exercise. These cases are mentioned to show the danger in well meant advice not coming from an expert.

SUMMARY

1. With the progress of our knowledge of tuberculosis we are more increasingly dependent on auxiliary means of securing rest than on tuberculins and climate, valuable as they are.

2. There is no valid reason why tuberculosis patients cannot be treated in a general hospital.

3. A greater familiarity on the part of the profession generally with various forms of tuberculosis and their modern treatment will be invaluable to the great mass of people, and will end in much earlier diagnosis.

4. Too much emphasis has been placed on climate and tuberculin therapy. The absolute neglect of diagnosis and treatment of the disease in general hospitals is the great weakness of our present organized efforts. We have plenty of beds in most places for lung cases, good care when once patients are landed in these beds, but insufficient attention paid to getting them there during the incipient stage when complete cure is most possible. Follow-up of cases is not sufficient. Teaching about tuberculosis in our medical schools needs improvement.

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DISCUSSION

CHARLES L. MCVEY, M. D. (Great Western Power Building, Oakland).—1. Should the surgeon examine the patient more carefully before enacting surgery?

Yes. Our faith lies in the future; in the hope that the ambitious surgeon will approach his surgery by way of his medical knowledge. Not more knowledge, but more care in history taking and more complete physical examinations are necessary. We get too busy, and then we get careless. "Of all men in the profession the forty-visits-a-day man is the most to be pitied" (Osler).

2. Should the general hospital make staff provision for a tuberculosis "expert"?

Yes. Especially if he be one who devotes but a portion of his energy to tuberculosis diagnosis and treatment. If he deals with tuberculosis exclusively, he is very apt to see tuberculosis too frequently. Except in rare instances, I believe this to be true.

It is a great help to have such a "modified expert" as a check on one's diagnosis and outline of therapy. Artificial pneumothorax should be entrusted to him and to no other.

3. Should tuberculosis be treated indefinitely and until its arrest in a general hospital?

No. The main objection to such a plan is that it is impractical unless (and this may be Doctor Brown's idea) a separate and distinct tuberculosis department be set aside in such a hospital. A separate unit might well provide the education, environment, and armamentarium which should be available in tuberculosis sanatoria. The patients of a general hospital come and go. When convalescing, the association of the tuberculous and the nontuberculous would not help the morale of the tuberculous nor aid in the convalescence of the general medical or surgical patient. The tuberculous patient wants to know and see someone who is similarly afflicted, or at least someone who may spend as long a time as he in getting well.

4. Can tuberculosis be diagnosed in a general hospital?

Yes. It may be trite to say that every modern hospital should be equipped with an armamentarium such as is necessary to establish a diagnosis.

5. Are tuberculosis "experts" always expert?

No. And until such time as tuberculosis experts become more expert, and of a purer mold, we will not speak of the food faddists who have carried on their trade from the beginning of medical history. How can a tuberculosis expert in a period of two minutes make a diagnosis of a tuberculous knee-joint? A patient was stripped to the waist on a cold winter's morning, in the open air, and a diagnosis of tuberculosis of the knee-joint was determined by a stethoscope applied to the chest. The case was later shown to have been a simple traumatic bursitis! This example is to offset (in a way to defend) the experience of the surgeon at the Ingleside race track.

6. What of the overcrowded, advertising type of tuberculosis sanatorium—boarding houses?

In agreement with Doctor Brown, should we not be more careful in sending a tuberculous patient away from home, especially to a questionable boarding house, where he receives poor food and too little nursing care and even less plumbing access?

7. What of antipneumococcic-staphylococcic-streptococcic vaccines? What of tuberculin?

There is no scientific background for the indiscriminate use of mixed respiratory vaccines in the treatment of tuberculosis. I refer to the pneumococcic-staphylococcic-streptococcic mixtures now in vogue. These are administered only to make the patient feel that he is receiving a specific to cure his disease. Ignorant of medical therapeutics, the patient believes there is potency in "a shot." Is it legitimate to encourage him in such a delusion? Tuberculin is losing ground. Therapeutically could we not get along very well without it?

C. E. ATKINSON, M. D. (Southern Sierras Sanatorium, Banning).—I heartily agree with most of Doctor Brown's conclusions, but ordinarily I do not believe that tuberculosis can be treated to the best advantage in a general hospital, chiefly because the environment and usual location, in or near congested areas, are undesirable. In a general hospital one meets many persons who are misinformed regarding the tuberculosis problem. These include patients, nurses, and physicians, who often indirectly influence those suffering from tuberculosis against taking the cure properly. Often the general atmosphere is decidedly "institutional and cold," and lacking in the friendliness, hope and cheer, which prevail in most well conducted sanatoria.

Yet it is necessary for certain patients to be treated in a general hospital, especially during emergencies

as when thoracoplasty is performed; so the medical personnel should have both adequate training and experience in this line. Sanatoria or hospitals without adequate equipment cannot do full justice to patients, but the most modern equipment is dangerous in the hands of the inexperienced. The diagnosis and treatment of tuberculosis require long experience. The course of tuberculosis is one of years, the average physician does not have opportunity to closely follow many cases to their termination, and may mistake a period of temporary improvement for permanent cure. As temporary improvement is often easily obtained, even in advanced cases, this leads him to doubt the necessity for early diagnosis. Consequently the opportune moment for securing an arrestment with comparative ease is passed by.

Early diagnosis is imperative, but is difficult to make. X-ray examination is highly important, but it is equally important not to rely too completely upon it. The x-ray often fails to register early tuberculosis, and fails to distinguish with accuracy an active from an inactive lesion. Valuable as this agency is, for the expert, it is my contention that those who are not thoroughly familiar with tuberculosis will arrive at a more accurate opinion by paying more attention to the history, symptoms, physical examination, and (bearing in mind that tuberculosis may be present in the absence of bacilli) study of the sputum, and less attention to x-ray evidence. In making an x-ray examination, complete study by means of stereoscopic films and fluoroscopy is advisable. A patient who was slightly run down, recently sought a precautionary examination. The history, physical examination, and x-ray films yielded no definite evidence. On the screen, fluid was at once visualized in the left pleura. More careful scrutiny revealed a partial pneumothorax, which, weighed with other slight findings, led to a diagnosis of tuberculosis. Without screen examination this case would have been missed.

In my experience, tuberculous patients often stand operations surprisingly well, yet the fact remains that surgery for other conditions is often resorted to too hastily and with too little understanding of the patient's entire problem. When border-line tonsils are found a determined effort should be made to ascertain whether these are the main source of toxemia. If the lungs are routinely examined by an expert, many unsuspected cases of tuberculosis will be brought to light and surgery will sometimes be avoided.

Doctor Brown (closing).—I appreciate very much the criticism of this problem of the tuberculosis division in a general hospital as it has been outlined by Doctor McVey. One sees the casual use of the stethoscope over the heart area of a patient about to be anesthetized and it is presumed in each case that the kidney function has been looked into. How many throat specialists are sure that the tonsils they remove, nearly 10 per cent of which are tuberculous, are not tonsils of persons with some trouble in the lung which is likely to be activated by the anesthetic?

If the proper examinations are made in a general hospital a great many cases who enter for surgery that is clearly indicated will be properly treated for their tuberculosis before the surgery if possible and will be operated on if necessary under conditions that minimize the dangers of anesthetics. If the work in the general hospital is well done, it is bound to uncover a great many cases who have not yet complained of the minimum symptoms from which they suffer.

THE HEART*

ITS CONDITION AS A FACTOR OF SURGICAL RISK

By Eugene S. Kilgore, M. D.
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Discussion *by John J. Sampson, M. D., San Francisco; R. Manning Clarke, M. D., Los Angeles; W. C. Smallwood, M. D., Long Beach.*

In examining the heart of a candidate for surgery the average physician is preoccupied largely with the detection of murmurs and high systolic blood pressure; and yet these are undoubtedly two of the least important criteria of surgical risk. They do serve to attract attention to a good many subjects with abnormal circulatory apparatus, and should prompt a careful scrutiny, but beyond this they are of little value. Even if we dismiss the large number of murmurs which are functional and consider only those that represent valvular lesions, experience shows that, other things being equal, patients with valvular disease tolerate surgery practically as well as normal subjects. The same may be said of hypertension within reasonable limits, provided other things are equal.

The other things required to be equal, that is, equal to normal, in these cases are: the rest of the body and particularly the myocardium. The pathologically-minded examiner will base practically his entire judgment of risk arising from the circulatory apparatus upon his estimate of the reserve power, endurance and stability of function of the myocardium. His judgment probably will be influenced by valvular or pericardial pathology, but only insofar as it modifies his view of the condition of the myocardium. The mere presence of valve scars will make him suspect that injury occurred to the musculature when the valves were infected, especially if he recognizes the effects of old rheumatic infection; and the extent of valvular deformity and consequent mechanical handicap may to some extent influence his judgment as to the amount of compensatory changes which have occurred and the amount of reserve power available for emergency use.

DIFFICULTIES IN ESTIMATING MYOCARDIAL CAPACITY

The assessment of the virtues of the myocardium presents many difficulties. None of the numerous functional tests thus far suggested have inspired any general confidence among cardiologists, and there are at least three strong theoretical considerations opposed to the hope that any such tests can ever be decisive for gauging surgical risk.

In the first place, the heart is not like the kidney. The latter can be tested by giving it a task at or even far beyond its capacity for the moment; the kidney takes its time to catch up and no harm is done. But any performance test applied to the heart, to be safe, must of course be far below its capacity.

In the second place, the strain to which the heart is subjected during and following surgery

* Read before the San Francisco County Medical Society on August 21, 1928.